Vector Control during Humanitarian Assistance Missions Aboard the U.S. Navy Hospital Ship Mercy

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The purpose of this presentation is to describe the activities of the Preventive Medicine Department on the U.S. Naval Ship (USNS) MERCY during Pacific Partnership 2008. Pacific Partnership was a humanitarian operation using the USNS MERCY as a platform to provide medical care to people in the Republic of the Philippines, Vietnam, Timor-Leste, Papua New Guinea, and the Federated States of Micronesia. The USNS MERCY visited each host nation for 10 to 14 days in the summer of 2008. During this time, medical providers on the ship saw over 90,000 patients, performed 1,300 surgeries, examined 14,000 dental patients, and conducted 26 engineering projects. The Preventive Medicine (PM) Department generated 26 reports covering all aspects of preventive medicine.

The PM Department conducted several reviews along with public health personnel from the host nations. The mission evolved as we progressed from one country to the next. The first mission site was Catobato City on the island of Mindanao, in the southern Philippines. Due to minimal planning for the preventive medicine function and because of the restrictive security situation, our mission was limited to collecting water samples. PM tested the water for the presence of coliform bacteria and 15 analytes using the Direct Reading Environmental Laboratory (DREL) 5000, from the HACH Corporation. A predetermined sampling plan did not exist. Still, results were given to local government and Armed Forces of the Philippines personnel for further action.

The Republic of Vietnam would not allow PM personnel to do any work in their country.

In Timor-Leste, a water sampling plan was developed. Samples were taken from five water treatment facilities, where we looked for the full range of analytes. Later, samples were taken from throughout the distribution system, looking only for lead, copper and coliform bacteria, analytes that can show up in water that has been fully treated but subsequently tainted by welds and cross-connections. Water treatment was more than adequate, but there was some contamination throughout the system. PM also provided inspections and recommendations regarding sewage treatment lagoons and a solid waste disposal dump and conducted five occupational safety reviews of industrial facilities.

In Papua New Guinea, PM followed the same water sampling plan. However, the water distribution system was different. We did some additional sampling of large water tanks that also held water for outlying communities. These communities did not have water piped to their homes; instead, they had to get water from the large storage tanks at the edge of Port Moresby's distribution system. Water treatment was very good, but there were problems in the distribution system. Again, PM

reviewed the sewage and solid waste disposal situations. The sewage lagoons were draining into a large freshwater lake. It is unlikely that recommendations to move the facility will be followed. We also worked with Civilian Mariner engineers from the USNS MERCY to fix several broken pieces of equipment at Port Moresby General Hospital. The engineers fixed the ventilation in the tuberculosis lab, making it possible for them to do tuberculosis tests for the first time in several years. The refrigeration in the morgue was also fixed.

In Chuuk State, Federated States of Micronesia, the PM Department reviewed water treatment facilities and sewage lagoons, as well as the solid waste dump. Food service inspections were also done in seven restaurants. PM conducted an epidemiological investigation of persons exposed to an individual with multi-drug resistant tuberculosis. This was a follow-up to an investigation that was started by the U.S. Centers for Disease Control and Prevention. We examined all 33 contacts that the CDC was unable to locate when they conducted their study a month earlier. Two new cases were found. The engineers fixed several items of equipment at the Chuuk state hospital.

Sewage lagoons are an acceptable way of treating sewage, but in all cases the facilities were too small relative to the use they received. PM recommended dredging the lagoons in order to increase the efficiency of treatment. The dumps were all run very inefficiently. Refuse was scattered and incineration was incomplete. In some cases, people lived in the dumps, surviving off whatever could be salvaged. PM recommended that the solid waste dumps be consolidated and encouraged greater efforts at recycling, moves that would enable the dumps to operate in accord with their design. We also made recommendations to improve the incineration process. Recycling would greatly reduce the volume of waste going into the dumps.

LCDR Prendergast continues to work with medical planners to build on these successes during future missions.